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POPLAR RIVER

COOPERATIVE MONITORING

ARRANGEMENT

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INTRODUCTION

1987 - SECOND QUARTER DATA EXCHANGE
POPLAR RIVER BASIN

The Poplar River Bilateral Monitoring Committee was authorized by the Governments of Canada and the United States under the Poplar River Cooperative Monitoring Arrangement dated September 23, 1980. The Committee is composed of representatives of the Governments of the United States, State of Montana, Canada, and Province of Saskatchewan. In addition to the representatives of governments, two ex officio members, who are local representatives of the State of Montana and Province of Saskatchewan, participate in activities of the Committee.

One responsibility of the Committee includes the on-going quarterly exchange of results of water quantity, water quality and air quality monitoring programs. The programs are being conducted in Canada and the United States at or near the International Boundary by cooperative monitoring agencies in accordance with the Technical Monitoring Schedules. Monitoring information is to be transmitted by each Committee co-chairman to his counterpart co-chairman within a reasonable period after the termination of each quarter. In addition, preselected parties are to receive copies of the quarterly exchange.

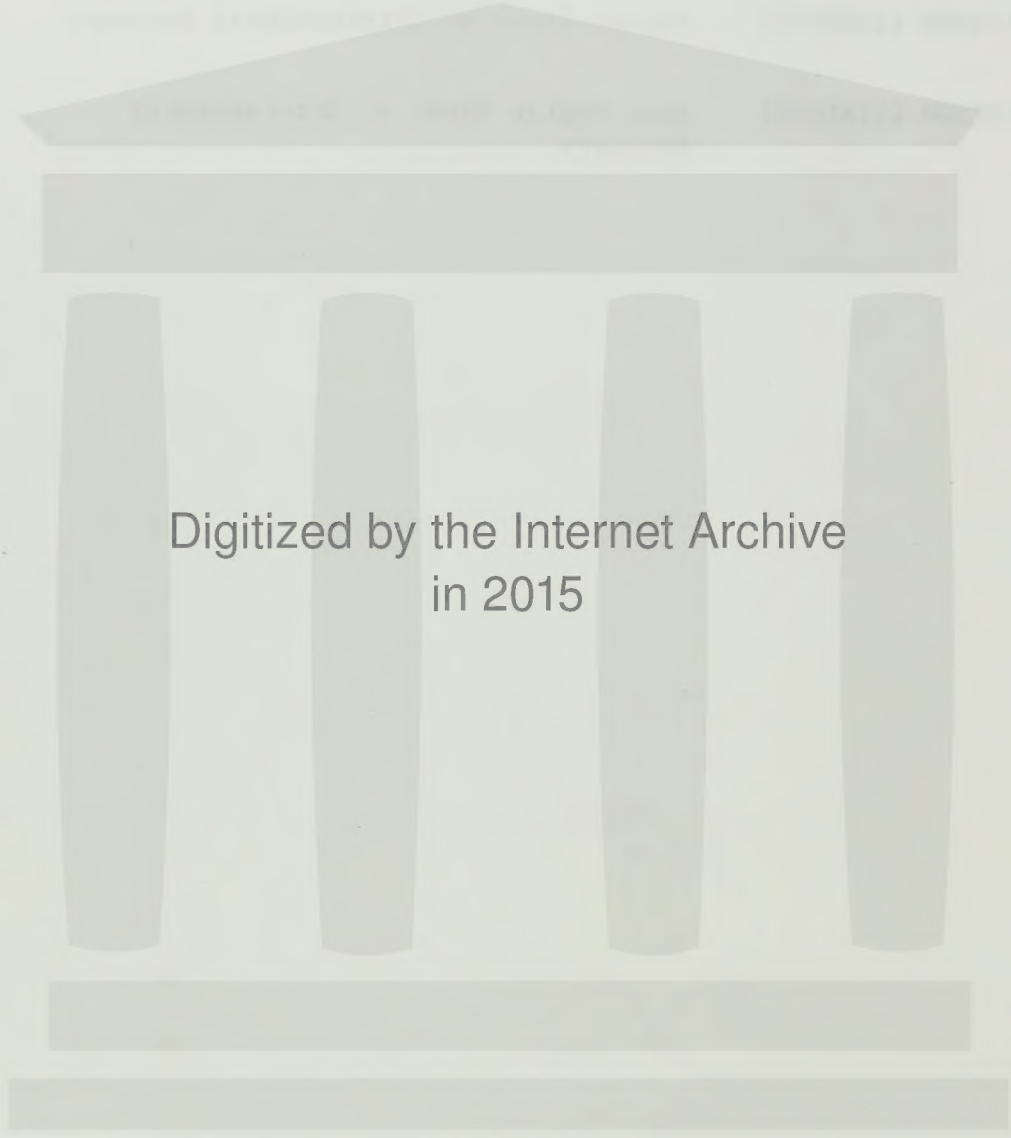
This package represents information collected by United States sources for the Poplar River basin during the third quarter of 1987. Included are data for surface water quantity, surface water quality, and ground-water levels.

STREAMFLOW MONITORING

Responsible Agency: United States Geological Survey

No. on Map	Station Number	Station Name
*1	06178000 (11AE008)	Poplar River at International Boundary
*2	06178500 (11AE003)	East Poplar River at International Boundary

* International gauging station



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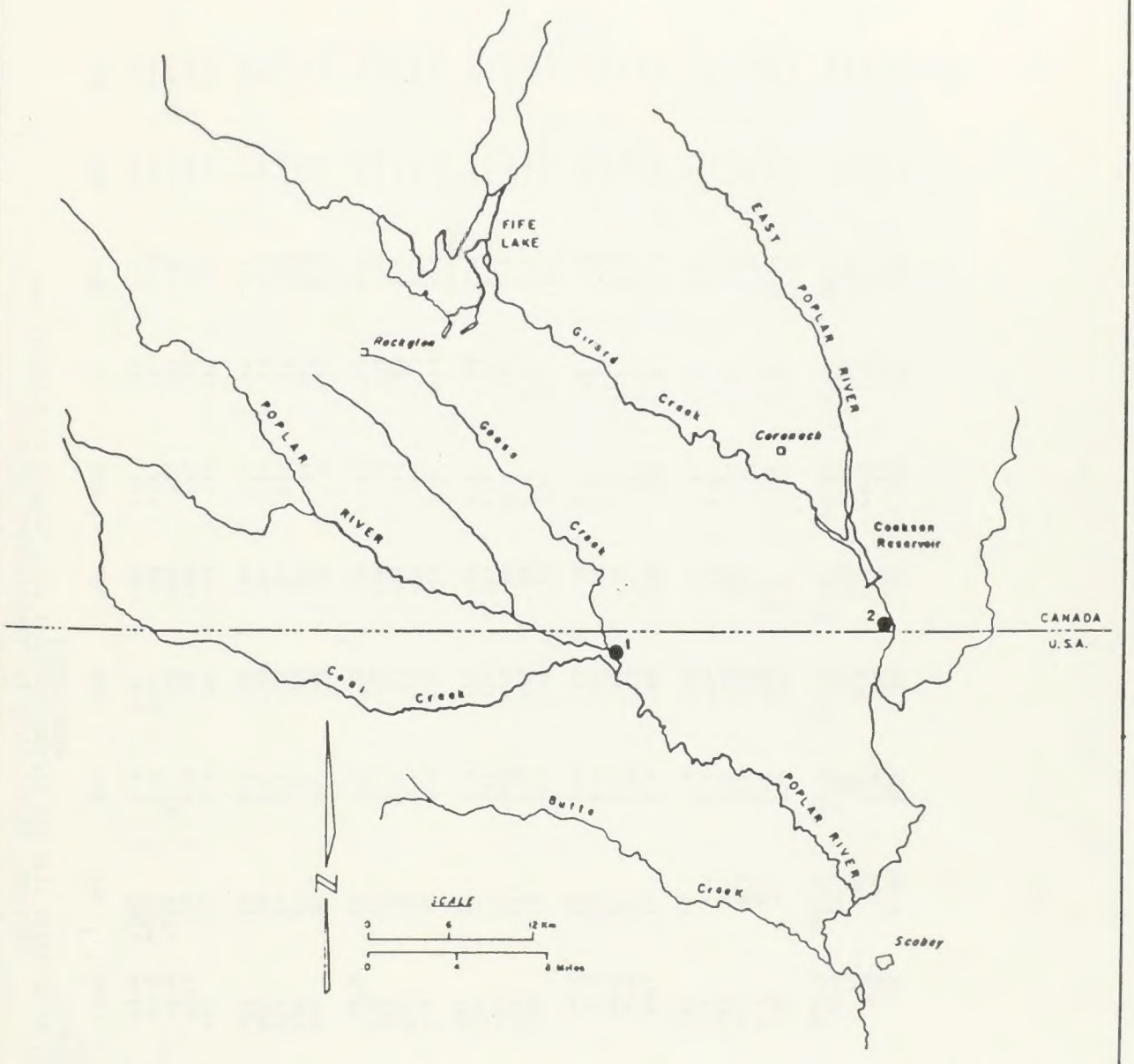


HYDROMETRIC GAUGING STATIONS (UNITED STATES)

06178000 POPLAR RIVER AT INTERNATIONAL BOUNDARY
DISCHARGE, IN CUBIC FEET PER SECOND, CALENDAR YEAR JANUARY TO DECEMBER 1987
MEAN VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	e5.0	e160	8.3	1.8	.09	1.3	.62	1.9	---	---
2	---	---	e4.0	e220	9.0	1.4	.08	1.2	.57	1.8	---	---
3	---	---	e5.0	e150	11	.93	.09	.83	.51	1.8	---	---
4	---	---	e8.0	93	9.0	.85	.06	.69	.36	1.8	---	---
5	---	---	e10	47	7.6	.66	.07	.68	.30	1.5	---	---
6	---	---	e15	34	6.7	.49	.07	.63	.26	1.5	---	---
7	---	---	e20	28	5.8	.23	.07	.55	.27	1.5	---	---
8	---	---	e15	26	5.1	.13	.07	.39	.26	1.6	---	---
9	---	---	e12	26	3.9	.18	.05	.31	.32	2.0	---	---
10	---	---	e10	24	3.4	.25	.28	.28	.29	2.4	---	---
11	---	---	e9.0	22	3.3	.23	.08	.31	.31	2.1	---	---
12	---	---	e10	21	3.1	.21	.06	.23	.21	2.0	---	---
13	---	---	e11	20	2.7	.18	.05	.42	.23	2.0	---	---
14	---	---	e12	19	2.4	.16	.04	.58	.23	2.0	---	---
15	---	---	e11	17	2.3	.14	.04	2.7	.21	2.0	---	---
16	---	---	e11	16	2.2	.17	.04	4.6	.29	2.2	---	---
17	---	---	e11	15	2.4	.16	.05	4.4	.50	2.4	---	---
18	---	---	e10	14	2.6	.15	.30	6.6	.94	2.5	---	---
19	---	---	e10	14	2.8	.23	.38	4.4	1.2	2.5	---	---
20	---	---	e10	13	2.8	.30	.26	3.0	1.1	2.4	---	---
21	---	---	e9.0	13	2.9	.19	.16	2.0	1.0	2.5	---	---
22	---	---	e9.0	12	2.4	.17	.14	1.4	.98	2.6	---	---
23	---	---	e8.0	12	2.2	.18	.91	1.1	1.1	2.7	---	---
24	---	---	e8.0	12	2.0	.12	1.1	.95	1.0	2.7	---	---
25	---	---	e8.0	11	1.9	.09	.90	.94	1.0	2.3	---	---
26	---	---	e10	10	1.9	.10	.71	1.0	1.0	3.1	---	---
27	---	---	e14	9.6	2.2	.09	.55	1.0	1.2	2.9	---	---
28	---	---	e20	9.1	3.6	.10	.44	.97	1.4	2.7	---	---
29	---	---	e28	8.6	3.7	.10	.71	.86	1.7	e2.6	---	---
30	---	---	e38	8.3	3.0	.09	1.6	.84	1.5	e2.5	---	---
31	---	---	e50	---	2.1	---	1.6	.77	---	e2.4	---	---
TOTAL	---	---	411.0	1084.5	124.2	10.12	11.04	45.95	21.25	69.3	---	---
MEAN	---	---	13.3	36.2	4.01	.34	.36	1.48	.71	2.24	---	---
MAX	---	---	50	220	11	1.8	1.6	6.6	1.8	3.1	---	---
MIN	---	---	4.0	8.3	1.9	.09	.04	.23	.21	1.5	---	---
AC-FT	---	---	815	2150	247	20	22	91	42	138	---	---

e Estimated

SURFACE WATER QUALITY MONITORING

Station Location

Responsible Agency: U.S. Geological Survey

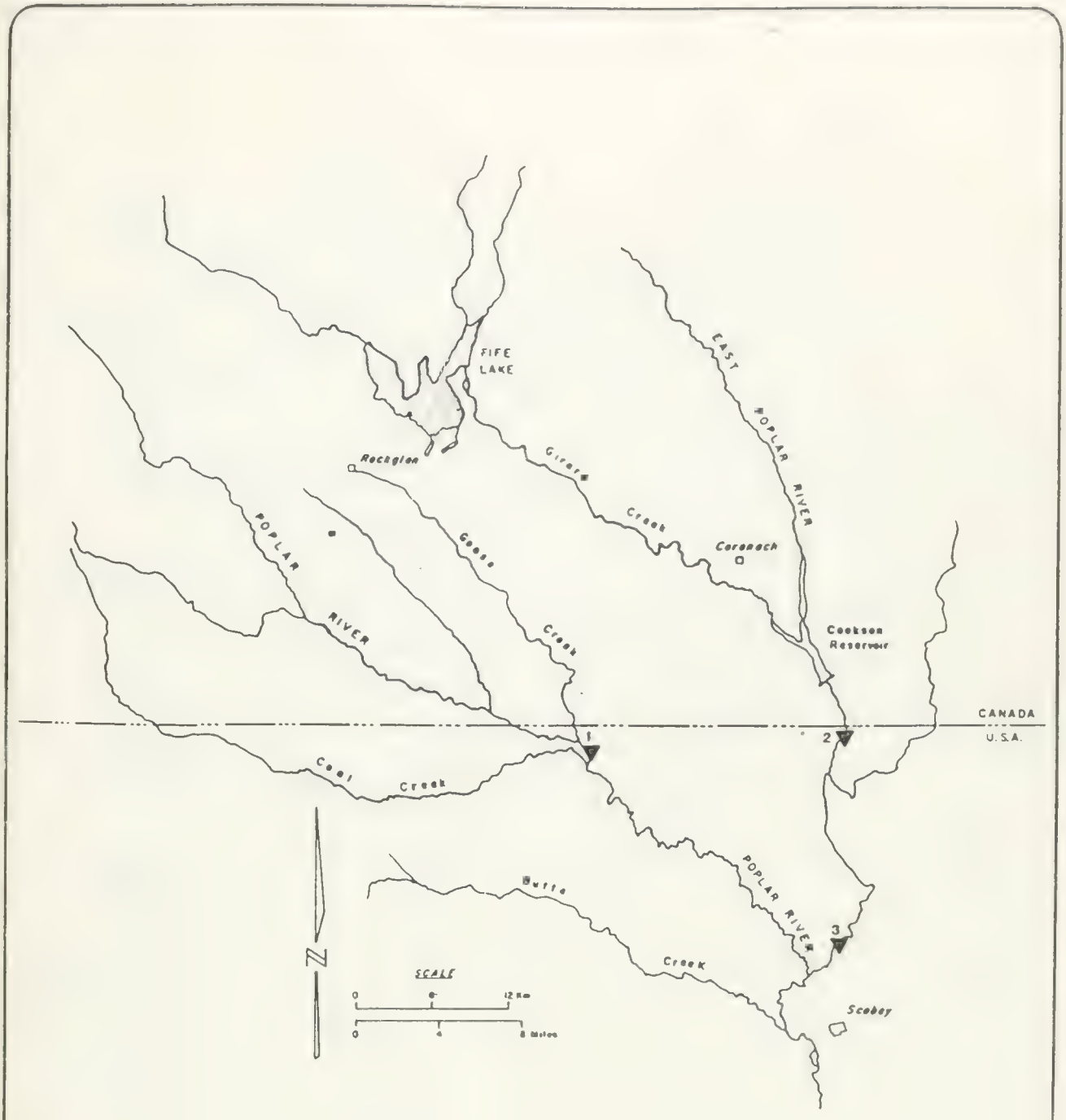
No. on Map	USGS Station No.	Station Name
1	06178000	Poplar River at International Boundary
2	06178500	East Poplar River at International Boundary
3	06179000	East Poplar River near Scobey

PARAMETERS

WATSTORE* Code	Parameter	Analytical method	Sampling Frequency No.	1	2	3
90410	Alkalinity-lab	Elect. Titration		M	M	M
01106	Aluminum-diss	AA		SA	SA	SA
00610	Ammonia-tot	Colorimetric		M	M	M
00625	Ammonia+Org N-tot	Colorimetric		M	M	M
01000	Arsenic-diss	AA, hydride		SA	SA	SA
01002	Arsenic-tot	AA, hydride		A	A	A
01010	Beryllium-diss	AA		SA	SA	SA
01012	Beryllium-tot/rec	AA-Persulfate		A	A	A
01020	Boron-diss	ICP		M	M	M
01025	Cadmium-diss	AA		SA	SA	SA
01027	Cadmium-tot/rec	AA-persulfate		A	A	A
00915	Calcium	AA		M	M	M
00680	Carbon-tot Org	Wet Oxidation		SA	SA	SA
00940	Chloride-diss	Ion chromatography		M	M	M
01030	Chromium-diss	AA		SA	SA	SA
01034	Chromium-tot/rec	AA-persulfate		A	A	A
00080	Color	Electrometric, visual		M	M	M
00095	Conductivity	Wheatstone Bridge		M	D	M
01040	Copper-diss	AA		SA	SA	SA
01042	Copper-tot/rec	AA-persulfate		A	A	A
00061	Discharge-inst	Direct measur.		M	M	M
00950	Fluoride	Electrometric		M	M	M
01046	Iron-diss	AA		M	M	M
01045	Iron-tot/rec	AA-persulfate		A	A	A
01049	Lead-diss	AA		SA	SA	SA
01051	Lead-tot/rec	AA-persulfate		A	A	A
00925	Magnesium-diss	AA		M	M	M
01056	Manganese-diss	AA		SA	SA	SA
01055	Manganese-tot/rec	AA-persulfate		A	A	A
01065	Nickel-diss	AA		SA	SA	SA
01067	Nickel tot/rec	AA-persulfate		A	A	A
00615	Nitrite-tot	Colorimetric		M	M	M
00630	Nitrate+Nitrite-tot	Colorimetric		M	M	M
00300	Oxygen-diss	Winkler/meter		M	M	M
70507	Phos, Ortho-tot	Colorimetric		M	M	M
00400	pH	Electrometric		M	M	M
00665	Phosphorous-tot	Colorimetric		M	M	M
00935	Potassium-diss	AA		M	M	M
00931	SAR	Calculated		M	M	M
80154	Sediment-conc.	Filtration-gravimetric		M	M	M
80155	Sediment-load	Calculated		M	M	M
01145	Selenium-diss	AA, hydride		SA	SA	SA
01147	Selenium tot/rec	AA, hydride		A	A	A
00955	Silica	Colorimetric		M	M	M
00930	Sodium	AA		M	M	M
00945	Sulfate-diss	Colorimetric		M	M	M
70301	Total Dissolved Solids	Calculated		M	M	M
00010	Temp Water	Toluene		M	M	M
00020	Temp Air	Toluene		M	M	M
00076	Turbidity	Nephelometric		M	M	M
80020	Uranium-diss	Fluorimetric		-	MC	-
01090	Zinc-diss	AA		SA	SA	SA
01092	Zinc-tot/rec	AA-persulfate		A	A	A

*Computer storage and retrieval system - USGS

Symbols: C-continuous; D-daily; M-monthly; MC-monthly composite; A-annually at high flow; SA-semi-annually at low and high flow; AA-atomic absorption; tot-total; rec-recoverable; diss-dissolved



SURFACE WATER QUALITY MONITORING STATIONS (UNITED STATES)

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WEATHER (WMO CODE NUMBER) (00041)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	TURBIDITY (NTU) (00076)	COLOR (PLATINUM-COBALT UNITS) (00080)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)
FEB												
18...	1000	0.0	0.0	707	0	E5.0	0	5.0	--	90	482	10.6
MAR												
17...	1200	0.5	1.0	703	100	E5.0	2	11	1.2	55	735	10.4
APR												
15...	1030	9.0	15.0	698	10	E20	1	17	2.3	45	780	9.4
MAY												
19...	1300	15.0	20.0	699	70	E0	3	2.7	3.0	27	1160	12.8
JUN												
17...	1500	24.0	25.0	700	0	E20	0	0.16	2.8	44	1680	12.2
JUL												
16...	1030	21.0	21.0	695	60	E15	1	0.05	--	--	1880	7.4
SEP												
15...	1200	15.0	21.0	700	60	E0	1	0.18	--	--	1710	6.4
OCT												
14...	1045	4.5	4.0	706	0	E15	0	2.0	--	--	1100	10.0

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	HARDNESS (MG/L AS CACO3) (00900)
FEB												
12...	75	8.20	8.03	2.6	1.1	0.020	0.010	1.1	<0.100	0.110	--	170
MAR												
17...	78	8.00	7.99	6.1	0.99	0.010	<0.010	1.0	<0.100	0.050	8.5	240
APR												
15...	99	8.61	8.40	1.7	0.99	0.010	<0.010	1.0	<0.100	0.050	--	260
MAY												
19...	139	9.02	8.40	0.9	--	<0.010	<0.010	1.5	<0.100	0.030	--	250
JUN												
17...	159	8.98	9.00	1.2	0.96	0.040	<0.010	1.0	<0.100	0.060	--	240
JUL												
16...	92	9.13	--	0	--	--	--	--	--	--	--	--
SEP												
15...	70	8.57	--	0	--	--	--	--	--	--	--	--
OCT												
14...	84	8.96	--	0	--	--	--	--	--	--	--	--

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CaCO3 (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM AD-SORPTION RATIO (00931)	PERCENT SODIUM (00932)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
FEB 13...	0	32	21	41	1	33	10	3.8	55	0.20	13
MAR 17...	0	45	30	78	2	41	7.7	4.4	95	0.30	12
APR 15...	0	47	36	76	2	38	7.1	3.1	81	0.30	8.0
MAY 19...	0	26	46	200	6	62	7.2	6.0	190	0.50	1.2
JUN 17...	0	20	47	320	9	73	8.4	16	340	0.50	0.7
JUL 16...	--	--	--	--	--	--	--	--	--	--	--
SEP 15...	--	--	--	--	--	--	--	--	--	--	--
OCT 14...	--	--	--	--	--	--	--	--	--	--	--

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	ARSENIC TOTAL (UG/L AS AS) (01002)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
FEB											
19...	--	--	--	--	280	--	--	--	--	--	--
MAR											
17...	1	2	<0.5	<10	460	<1	<1	<10	<10	1	4
APR											
15...	--	--	--	--	500	--	--	--	--	--	--
MAY											
19...	--	--	--	--	1100	--	--	--	--	--	--
JUN											
17...	--	--	--	--	1800	--	--	--	--	--	--
JUL											
16...	--	--	--	--	--	--	--	--	--	--	--
SEP											
15...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

06178000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)
FEB											
18...	--	200	--	--	--	--	--	--	--	--	--
MAR											
17...	230	150	<5	<5	20	14	<1	5	5	<10	10
APR											
15...	--	100	--	--	--	--	--	--	--	--	--
MAY											
19...	--	41	--	--	--	--	--	--	--	--	--
JUN											
17...	--	21	--	--	--	--	--	--	--	--	--
JUL											
16...	--	--	--	--	--	--	--	--	--	--	--
SEP											
15...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

06179000 - POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ALKALINITY LAB (MG/L AS CACO3) (90410)
FEB											
18...	--	--	300	4.1	0.41	55	0.050	9	0.12	494	214
MAR											
17...	<1	<1	460	13	0.63	60	0.010	2	0.00	705	316
APR											
15...	--	--	480	22	0.65	57	0.010	12	0.50	762	356
MAY											
19...	--	--	770	5.5	1.0	--	<0.010	29	0.21	1220	496
JUN											
17...	--	--	1100	0.43	1.5	41	<0.010	10	0.00	1730	596
JUL											
16...	--	--	--	--	--	50	--	30	0.00	--	--
SEP											
15...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

06178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WEATHER (WMO CODE NUMBER) (00041)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	TURBIDITY (NTU) (00076)	COLOR (PLATINUM-COBALT UNITS) (00080)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)
JAN												
14...	1300	0.0	-3.0	711	100	E20	2	3.6	1.4	7	1420	10.0
FEB												
18...	1130	0.0	2.0	708	0	E5.0	0	3.3	--	10	1400	12.4
MAR												
17...	1430	0.5	1.0	703	100	E5.0	2	3.2	2.3	13	1400	12.0
APR												
15...	1300	11.0	17.5	697	10	E25	1	2.9	3.5	19	1430	11.2
MAY												
19...	0800	11.5	8.5	700	100	E0	3	12	4.4	21	1230	8.2
JUN												
17...	1100	21.0	23.0	705	10	E20	1	2.4	2.2	20	1420	7.0
JUL												
15...	1330	23.0	26.0	697	60	E20	1	2.6	2.2	23	1500	8.4
SEP												
15...	1500	17.0	26.0	700	60	E0	1	2.4	--	--	1520	8.2
OCT												
07...	1000	6.5	14.0	706	5	E5.0	1	2.3	--	--	1450	10.2

06178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	NITROGEN, TOTAL (MG/L AS N) (00600)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
JAN												
14...	74	7.90	7.83	13	0.90	0.09	0.610	<0.010	0.70	0.200	0.010	--
FEB												
18...	92	7.90	7.81	13	0.90	0.30	0.500	<0.010	0.80	0.100	0.010	--
MAR												
17...	91	8.10	7.84	8.1	1.4	0.91	0.390	<0.010	1.3	0.100	0.020	3.5
APR												
15...	112	8.65	8.30	2.2	--	1.3	0.040	<0.010	1.3	<0.100	0.040	--
MAY												
19...	32	8.55	8.60	2.6	--	1.3	0.140	0.010	1.4	<0.100	0.030	--
JUN												
17...	95	8.50	8.40	3.1	--	2.8	0.030	<0.010	2.8	<0.100	0.070	--
JUL												
16...	108	8.43	8.30	3.5	--	0.85	0.050	<0.010	0.90	<0.100	0.030	--
SEP												
15...	93	8.22	--	0	--	--	--	--	--	--	--	--
OCT												
07...	90	8.50	--	0	--	--	--	--	--	--	--	--

05175500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	HARDNESS (MG/L AS CACO3) (00900)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)	PERCENT SODIUM (00932)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)
JAN 14...	400	0	81	47	190	4	51	8.9	8.0	280	0.30	14
FEB 18...	400	0	93	47	190	4	50	9.2	8.9	290	0.30	13
MAR 17...	390	0	79	47	190	4	51	8.6	8.4	280	0.40	13
APR 15...	350	0	81	49	200	5	54	9.4	8.1	230	0.40	9.2
MAY 19...	320	0	87	49	180	4	54	13	8.0	240	0.30	9.7
JUN 17...	330	0	87	52	220	5	58	7.9	8.0	300	0.30	10
JUL 16...	350	0	96	52	210	5	56	7.1	6.6	320	0.30	9.3
SEP 15...	--	--	--	--	--	--	--	--	--	--	--	--
OCT 07...	--	--	--	--	--	--	--	--	--	--	--	--

05178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	ARSENIC TOTAL (UG/L AS AS) (01002)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
JAN												
14...	--	--	--	--	1700	--	--	--	--	--	--	--
FEB												
18...	--	--	--	--	1900	--	--	--	--	--	--	--
MAR												
17...	2	3	<0.5	<10	1700	<1	<1	<10	<10	1	4	670
APR												
15...	--	--	--	--	1700	--	--	--	--	--	--	--
MAY												
19...	--	--	--	--	1400	--	--	--	--	--	--	--
JUN												
17...	--	--	--	--	2100	--	--	--	--	--	--	--
JUL												
16...	--	--	--	--	2000	--	--	--	--	--	--	--
SEP												
15...	--	--	--	--	--	--	--	--	--	--	--	--
OCT												
07...	--	--	--	--	--	--	--	--	--	--	--	--

06178500 - EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)
JAN											
14...	10	--	--	--	--	--	--	--	--	--	--
FEB											
18...	12	--	--	--	--	--	--	--	--	--	--
MAR											
17...	10	<5	<5	180	180	<1	4	11	<10	<10	<1
APR											
15...	12	--	--	--	--	--	--	--	--	--	--
MAY											
19...	11	--	--	--	--	--	--	--	--	--	--
JUN											
17...	25	--	--	--	--	--	--	--	--	--	--
JUL											
16...	8	--	--	--	--	--	--	--	--	--	--
SEP											
15...	--	--	--	--	--	--	--	--	--	--	--
OCT											
07...	--	--	--	--	--	--	--	--	--	--	--

DATE	SELENIUM, TOTAL (UG/L AS SE) (01147)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	NITROGEN, TOTAL (MG/L AS NO3) (71887)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ALKALINITY LAB (MG/L AS CACO3) (90410)
JAN											
14...	--	940	9.2	1.3	26	0.020	4.0	95	0.92	1460	527
FEB											
18...	--	960	8.6	1.3	19	<0.010	4.0	46	0.41	1450	539
MAR											
17...	<1	940	8.1	1.3	7	<0.010	0.2	48	0.41	1410	528
APR											
15...	--	920	7.1	1.2	80	<0.010	--	20	0.15	1420	507
MAY											
19...	--	830	28	1.1	83	<0.010	--	37	1.2	1290	476
JUN											
17...	--	960	6.3	1.3	71	<0.010	--	9	0.06	1480	510
JUL											
16...	--	950	6.8	1.3	66	<0.010	--	19	0.13	1420	489
SEP											
15...	--	--	--	--	--	--	--	--	--	--	--
OCT											
07...	--	--	--	--	--	--	--	--	--	--	--

06178500 EAST POPLAR RIVER AT INTERNATIONAL BOUNDARY
SPECIFIC CONDUCTANCE MICROSIEMENS/CM AT 25 DEG C, CALENDAR YEAR JANUARY TO DECEMBER 1987
INSTANTANEOUS VALUES

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	1390	1390	1410	1270	1240	1280	1380	1360	1360	---	---	---
2	1420	1430	1350	1200	1240	1290	1390	1370	1380	---	---	---
3	1410	1420	1400	1340	1250	1300	1390	1400	1390	---	---	---
4	1400	1400	1360	1210	1340	1310	1380	1400	1400	---	---	---
5	1430	1270	1290	1150	1320	1340	1380	1400	1380	---	---	---
6	1420	1380	1180	1150	1260	1400	1360	1390	1380	---	---	---
7	1330	1360	1110	1240	1260	1400	1360	1370	1400	---	---	---
8	1450	1370	1080	1280	1260	1410	1370	1410	1390	---	---	---
9	1500	1360	1200	1330	1270	1420	1370	1390	1380	---	---	---
10	1500	1360	1320	1350	1250	1410	1370	1400	1380	---	---	---
11	1470	1370	1360	1360	1260	1400	1390	1400	1370	---	---	---
12	1460	1380	1420	1350	1240	1370	1370	1390	1390	---	---	---
13	1430	1410	1430	1350	1250	1370	1350	1380	1390	---	---	---
14	1420	1410	1380	1370	1230	1390	1380	1370	1590	---	---	---
15	1460	1420	1380	1380	1220	1400	1390	1370	1590	---	---	---
16	1590	1410	1390	1430	1250	1410	1430	1370	1520	---	---	---
17	1580	1450	1390	1450	1260	1420	1440	1360	1520	---	---	---
18	1520	1440	1410	1260	1250	1420	1370	1360	1410	---	---	---
19	1520	1420	1410	1260	1250	1430	1390	1340	1400	---	---	---
20	1500	1420	1370	1270	1260	1400	1360	1350	1420	---	---	---
21	1510	1410	1400	1250	1250	1430	1340	1370	1440	---	---	---
22	1490	1440	1400	1260	1240	1390	1350	1380	1430	---	---	---
23	1500	1470	1380	1260	1260	1400	1400	1400	1430	---	---	---
24	1500	1470	1390	1270	1230	1380	1420	1410	1430	---	---	---
25	1490	1480	1410	1270	1230	1380	1400	1420	1420	---	---	---
26	1490	1500	1410	1280	1250	1400	1390	1420	1420	---	---	---
27	1470	1490	1360	1270	1250	1400	1390	1410	1420	---	---	---
28	1450	1490	1440	1280	1250	1390	1380	1400	1460	---	---	---
29	1440	---	1430	1260	1260	1380	1380	1400	1420	---	---	---
30	1430	---	1480	1260	1240	1380	1370	1400	1410	---	---	---
31	1430	---	1460	---	1250	---	1380	1410	---	---	---	---
MEAN	1465	1415	1361	1289	1254	1383	1381	1387	1424	---	---	---
MAX	1590	1500	1480	1450	1340	1430	1440	1420	1590	---	---	---
MIN	1330	1270	1080	1150	1220	1280	1340	1340	1360	---	---	---

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	TIME	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRESSURE (MM OF HG) (00025)	CLOUD COVER (PERCENT) (00032)	WIND SPEED (MILES PER HOUR) (00035)	WEATHER (WMO CODE NUMBER) (00041)	STREAMFLOW, INSTANTANEOUS (CFS) (00061)	TURBIDITY (NTU) (00076)	COLOR (PLATINUM-COBALT UNITS) (00080)	SPECIFIC CONDUCTANCE (US/CM) (00095)	OXYGEN, DISSOLVED (MG/L) (00300)
JAN 15...	0900	0.0	-22.0	720	0	E0	0	3.5	2.2	9	1780	12.3
FEB 19...	1300	0.0	3.0	709	0	E5.0	0	3.3	2.5	10	1320	11.8
MAR 17...	1600	0.5	1.0	704	100	E5.0	2	3.5	2.0	16	1040	12.0
APR 15...	1430	11.0	18.0	697	10	E25	1	5.0	3.5	75	752	9.2
MAY 20...	0730	11.0	4.0	708	100	E25	3	13	3.4	34	1340	7.0
JUN 17...	1300	21.0	23.0	707	10	E20	1	2.5	3.7	27	1360	10.0
JUL 10...	1430	22.0	26.0	699	50	E15	1	3.0	2.0	55	1560	8.6
SEP 10...	0700	15.0	9.0	705	90	E15	1	2.5	--	--	1510	9.2
OCT 14...	0330	5.0	-3.0	710	0	E0	0	3.0	--	--	1600	9.2

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	PH (STANDARD UNITS) (00400)	PH LAB (STANDARD UNITS) (00403)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2) (00405)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOSPHORUS, TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	HARDNESS (MG/L AS CACO3) (00900)
JAN												
15...	93	8.10	7.94	9.4	0.57	0.030	<0.010	0.60	<0.100	0.020	--	470
FEB												
16...	87	8.20	8.01	5.7	0.28	0.020	<0.010	0.30	<0.100	0.010	--	320
MAR												
17...	90	8.50	8.19	2.3	0.68	0.020	<0.010	0.70	<0.100	0.020	4.3	270
APR												
15...	92	8.81	8.20	0.8	1.4	0.020	<0.010	1.4	<0.100	0.070	--	200
MAY												
20...	59	8.83	8.30	1.4	1.9	0.020	<0.010	1.9	<0.100	0.060	--	310
JUN												
17...	122	9.06	9.00	0.8	0.96	0.040	<0.010	1.0	<0.100	0.070	--	230
JUL												
15...	108	9.62	9.20	0.2	2.0	0.040	<0.010	2.0	<0.100	0.050	--	240
SEP												
16...	67	9.10	--	0	--	--	--	--	--	--	--	--
OCT												
14...	78	9.06	--	0	--	--	--	--	--	--	--	--

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM ADSORPTION RATIO (00931)	PERCENT SODIUM (00932)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)
JAN											
15...	0	90	60	250	5	53	8.5	10	360	0.40	6.9
FEB											
12...	0	58	43	170	4	53	6.3	7.6	250	0.30	6.0
MAR											
17...	0	47	36	140	4	53	5.3	5.9	200	0.30	6.0
APR											
15...	0	37	27	85	3	46	9.3	3.6	110	0.30	7.4
MAY											
20...	0	30	53	200	5	57	13	6.0	260	0.30	2.6
JUN											
17...	0	22	55	230	6	62	15	7.5	280	0.30	1.7
JUL											
16...	0	15	48	260	7	69	12	7.6	330	0.40	2.4
SEP											
16...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	ARSENIC TOTAL (UG/L AS AS) (01002)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE) (01012)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
JAN											
15...	--	--	--	--	2000	--	--	--	--	--	--
FEB											
18...	--	--	--	--	1400	--	--	--	--	--	--
MAR											
17...	1	2	<0.5	<10	1000	<1	<1	<10	<10	1	5
APR											
15...	--	--	--	--	610	--	--	--	--	--	--
MAY											
20...	--	--	--	--	1700	--	--	--	--	--	--
JUN											
17...	--	--	--	--	1700	--	--	--	--	--	--
JUL											
16...	--	--	--	--	2100	--	--	--	--	--	--
SEP											
16...	--	--	--	--	--	--	--	--	--	--	--
OCT.											
14...	--	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1937 TO DECEMBER 1937

DATE	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)
JAN											
15...	--	16	--	--	--	--	--	--	--	--	--
FEB											
18...	--	32	--	--	--	--	--	--	--	--	--
MAR											
17...	260	29	<5	<5	30	13	<1	4	3		<10
APR											
15...	--	99	--	--	--	--	--	--	--	--	--
MAY											
20...	--	33	--	--	--	--	--	--	--	--	--
JUN											
17...	--	33	--	--	--	--	--	--	--	--	--
JUL											
15...	--	39	--	--	--	--	--	--	--	--	--
SEP											
16...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, CALENDAR YEAR JANUARY 1987 TO DECEMBER 1987

DATE	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	PHOSPHORUS, ORTHO, TOTAL (MG/L AS P) (70507)	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SPECIFIC CONDUCTANCE LAB (US/CM) (90095)	ALKALINITY LAB (MG/L AS CACO3) (90410)
JAN											
15...	--	--	1200	11	1.6	36	0.010	27	0.26	1810	612
FEB											
18...	--	--	840	7.5	1.1	27	<0.010	44	0.39	1250	473
MAR											
17...	<1	<1	670	6.3	0.91	41	<0.010	33	0.31	995	378
APR											
15...	--	--	450	6.1	0.61	97	<0.010	8	0.11	729	286
MAY											
20...	--	--	880	31	1.2	71	<0.010	40	1.4	1400	513
JUN											
17...	--	--	900	6.1	1.2	34	<0.010	19	0.13	1400	493
JUL											
16...	--	--	980	8.0	1.3	67	<0.010	5	0.04	1480	537
SEP											
16...	--	--	--	--	--	--	--	--	--	--	--
OCT											
14...	--	--	--	--	--	--	--	--	--	--	--

GROUND WATER LEVELS TO MONITOR

POTENTIAL DRAWDOWN DUE TO

COAL SEAM DEWATERING

Responsible Agency: Montana Bureau of Mines and Geology

No. on Map	Sampling
2 to 22	Determine water levels quarterly

Station Locations

Responsible Agency: Montana Bureau of Mines and Geology

Map Number	Well Location	Total Depth (m)	Casing Diameter (cm)	Aquifer	Perforation Zone (m)
2	37N47E17DABB	79	3.8 PVC	Hart Coal	76-79
3	37N47E23AADD	36	3.8 PVC	Hart Coal	33-36
4	37N46E23BBCC	104	3.8 PVC	Fox Hills-Hell Creek	102-104
5	37N47E1ABBB1	16	10.2 PVC	Alluvium	10-13
6	37N47E1ABBB2	25	10.2 PVC	Hart Coal	19-25
7	37N47E12BBBB	45	10.2 PVC	Hart Coal	39-45
8	37N47E13AADD	14	10.2 PVC	Alluvium	10-13
9	37N47E13ADAA01	43			
10	37N48E5BABB	63	10.2 PVC	Fort Union	16-62
11	37N48E5AAAA	13	10.2 PVC	Alluvium-Coal	7-13
12	37N47E Sec 11 DDDD	67	15.2 STEEL	Fox Hills-Hell Creek	65-67
13	37N47E Sec 3 CCCC	26	5.08	Hart Coal	15-18
14	37N47E Sec 4 BBAB	82.5	10.2	Hart Coal	56-59
15	37N47E Sec 3 BBAA	82.6	10.2	Hart Coal	75-78
16	37N46E Sec 3 ABAB	89	10.2	Hart Coal	83-86
17	37N47E Sec 16 DDDD	26	10.2		24-25
18	37N46E Sec 1 BBBA	88	10.6	Hart Coal	80-83
19	37N47E Sec 15 AAAB	90	10.2	Hart Coal	80-82
20	37N47E Sec 24 CCCC	59	10.2	Hart Coal	54-56
21	37N47E Sec 6 DBAA	22	5.08		19-22
22	37N47E Sec 9 CBCC	106	10.2	Hart Coal	100-103
		21	10.2		18-21

GROUND WATER QUALITY MONITORING (UNITED STATES)

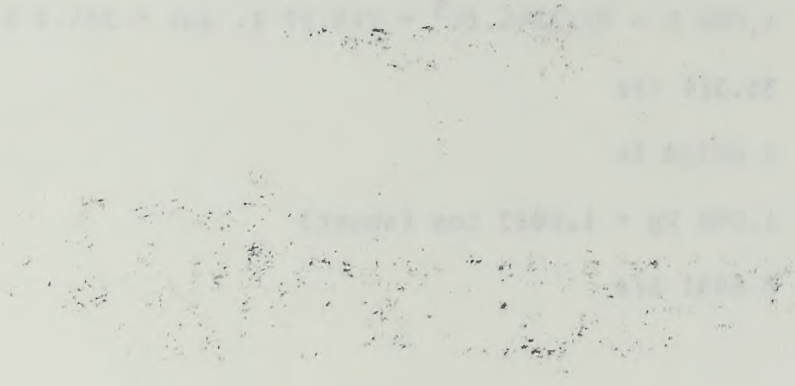
GROUND-WATER LEVEL MEASUREMENTS

Well no.	Depth to water (feet) March 24, 1987	Depth to water (feet) June 23, 1987
2	217.90	217.89
3	81.69	81.92
4	60.75	60.86
5	20.10	20.34
6	20.63	20.78
7	78.48	77.62
8	13.26	14.22
9	13.79	14.76
10	5.69	5.98
11	-0.96	-0.90
12	dry	--
13	134.68	134.71
14	212.36	212.40
15	224.11	224.21
16	37.20	37.06
17	247.95	247.99
18	247.66	247.77
19	126.06	126.06
20	dry	--
21	240.99	240.88
22	14.99	14.62

(-) Indicates water level above land surface

METRIC CONVERSION FACTORS

ac	=	4,047 m^2 = 0.4047 ha
ac-ft	=	1,233.5 m^3 = 1.2335 dam^3
C°	=	1.8 F°
cm	=	0.3937 in.
cm^2	=	0.155 in^2
dam^3	=	1,000 m^3 = 0.8107 ac-ft
ft^3	=	28.3171 x $10^{-3}m^3$
ha	=	10,000 m^2 = 2.471 ac
hm	=	100 m = 328.08 ft
hm^3	=	1 x 10^6 m^3
I.gpm	=	0.0758 L/s
in	=	2.54 cm
kg	=	2.20462 lb = 1.1 x 10^{-3} tons
km	=	0.62137 miles
km^2	=	0.3861 mi^2
L	=	0.3532 ft^3 = 0.21997 I. gal = 0.26420 U.S. gal
L/s	=	0.035 cfs = 13.193 I.gpm = 15.848 U.S. gpm
m	=	3.2808 ft
m^2	=	10.7636 ft^2
m^3	=	1,000 L = 35.3144 ft^3 = 219.97 I. gal = 264.2 U.S. gal
m^3/s	=	35.314 cfs
mm	=	0.00328 ft
tonne	=	1,000 kg = 1.1023 ton (short)
U.S. gpm	=	0.0631 L/s

For Air Samples

ppm = 100 pphm = 1000 X (Molecular Weight of substance/24.45) mg/m^3